

What is Claimed is:

1. An air conditioning system comprising:

a compressor;

a flow path control valve for shifting, and guiding a flow path of refrigerant from the

5 compressor proper to respective operation modes;

first and second heat exchangers connected to respective outlets of the flow path control valve for condensing or vaporizing the refrigerant;

an expansion device on a refrigerant pipeline connected between the first and second heat exchangers, for expanding refrigerant either from the first or second heat exchanger;

10 a first fan for blowing external air into a room through the first heat exchanger;

a second fan for blowing room air to an exterior through the second heat exchanger;

and

a regenerative heat exchanger for making indirect heat exchange of the external air and room air respectively blown by the first and second fans.

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2. The air conditioning system as claimed in claim 1, wherein the regenerative heat exchanger includes;

first flow passages spaced a predetermined distance away from each other for flow of the room air;

20 second flow passages in contact with, and between adjacent first flow passages for flow of the external air.

3. The air conditioning system as claimed in claim 1, wherein the regenerative heat

exchanger is mounted at a point the external air and the room air cross each other, and includes;

a plurality of plates spaced a distance away from each other for alternate flow of the external air and the room air through each layer, and

5 a flow guide plate between adjacent plates in parallel to a flow direction of the external air or the room air, each having a cross section of a plurality of continuous folds.

4. The air conditioning system as claimed in claim 3, wherein the fold includes;
an upward slope extending from a left lower point to a middle peak point, and
10 a downward slope extending from the middle peak point to a right lower point.

5. The air conditioning system as claimed in claim 3, wherein the external air and the room air flow substantially perpendicular to each other.

15 6. An air conditioner comprising:

a case having air inlet and outlet passages therein perpendicular to each other, and a plurality of air inlet and outlets at ends of the air inlet and outlet passages;

a regenerative heat exchanger at a cross point of the air inlet and outlet passages for making indirect heat exchange of the external air and room air flowing through the air inlet
20 and outlet passages;

a compressor in the case;

a flow path control valve for shifting, and guiding a flow path of refrigerant from the compressor proper to respective operation modes;

first and second heat exchangers connected to respective outlets of the flow path

control valve and provided to the air inlet and discharge passages for condensing or vaporizing the refrigerant guided by the flow path control valve;

an expansion device on a refrigerant pipeline connected between the first and second heat exchangers, for expanding refrigerant either from the first or second heat exchanger;

5 a first fan in the air inlet passage for blowing external air into a room through the first heat exchanger; and

a second fan in the air outlet passage for blowing the room air to an exterior through the second heat exchanger.

10 7. The air conditioner as claimed in claim 6, wherein the air inlet passages and the air outlet passages are provided by ducts mounted in a crossed form in the case.

8. The air conditioner as claimed in claim 7, wherein the air inlets include a first air inlet for making the air outlet passage and the room be in communication, and first air outlet
15 for making the air inlet passage and the exterior be in communication, and

the air outlets include a first air outlet for making the air inlet passage and the room be in communication and a second air outlet for making the air outlet passage and the exterior be in communication.

20 9. The air conditioner as claimed in claim 8, wherein the first air inlet and the first air outlet are formed in two faces of outside faces of the case formed to face different directions.

10. The air conditioner as claimed in claim 8, wherein the case further includes a plurality of louvers rotatably mounted to the first air outlet for adjusting a discharge direction

of air.

11. The air conditioner as claimed in claim 6, wherein the regenerative heat exchanger includes;

5 first flow passages spaced a predetermined distance away from each other for flow of the room air;

second flow passages in contact with, and between adjacent first flow passages for flow of the external air.

10 12. The air conditioner as claimed in claim 6, wherein the external air and the room air flow substantially perpendicular to each other in the regenerative heat exchanger.

13. The air conditioner as claimed in claim 8, wherein the regenerative heat exchanger includes;

15 a plurality of plates spaced a distance away from each other for alternate flow of the external air and the room air through each layer, and

a flow guide plate between adjacent plates in parallel to a flow direction of the external air or the room air, each having a cross section of a plurality of continuous folds.

20 14. The air conditioner as claimed in claim 13, wherein the fold includes;
an upward slope extending from a left lower point to a middle peak point, and
a downward slope extending from the middle peak point to a right lower point.

15. The air conditioner as claimed in claim 13, wherein the first heat exchanger is

provided between the regenerative heat exchanger and the first air outlet, and the second heat exchanger is provided between the regenerative heat exchanger and the second air outlet.

16. The air conditioner as claimed in claim 15, wherein the second heat exchanger is
5 mounted adjacent to the regenerative heat exchanger, and the first heat exchanger is mounted adjacent to the first air outlet.

17. The air conditioner as claimed in claim 15, wherein the first fan is mounted
between the regenerative heat exchanger and the first heat exchanger, and the second fan is
10 mounted between the first air inlet and the regenerative heat exchanger.

18. The air conditioner as claimed in claim 15, wherein the compressor is mounted adjacent to the second air outlet in the air outlet passage.

15 19. The air conditioner as claimed in claim 6, wherein the case further includes;
condensed water receiving grooves in parts of a bottom thereof under lower parts of
the first and second heat exchangers respectively,
a drain channel connected to the condensed water receiving grooves, and
a drain provided in the bottom of the drain channel.

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20. The air conditioner as claimed in claim 13, wherein the condensed water receiving grooves have sloped bottoms for leading the condensed water toward the drain channel.

21. The air conditioner as claimed in claim 19, wherein the drain channel connects one or opposite ends of each of the condensed water receiving grooves.

22. The air conditioner as claimed in claim 19, wherein the drain channel has a sloped
5 bottom for leading the condensed water toward the drain.

23. The air conditioner as claimed in claim 22, wherein the drain is provided to a side adjacent to an outdoor.

10 24. The air conditioner as claimed in claim 8, wherein the air inlet further includes a third air inlet for making the air inlet passage and the room be in communication.

25. The air conditioner as claimed in claim 24, wherein the third air inlet is provided between the regenerative heat exchanger and the first air outlet.

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26. The air conditioner as claimed in claim 25, wherein the third air inlet is provided in the bottom of the case.

27. The air conditioner as claimed in claim 24, further comprising a flow passage
20 opening/closing device in the case for selective opening/closing of the third air inlet and the air inlet passage.

28. The air conditioner as claimed in claim 27, wherein the flow passage opening/closing device includes;

opening/closing panel hinge coupled to a bottom of the case between the regenerative heat exchanger and the third air inlet,

a driving device mounted in the case, and

a linkage connected between the driving device and the opening/closing panel for
5 selective opening/closing of the third air inlet and the air inlet passage with the opening/closing panel following operation of the driving device.

29. The air conditioner as claimed in claim 28, wherein the driving device is a reversible motor.

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30. The air conditioner as claimed in claim 8, wherein the compressor, the first and second evaporators, the first and second fans, and the regenerative heat exchangers are slid into/out of the case through sides of the case in mounting/dismounting the compressor, the first and second evaporators, the first and second fans, and the regenerative heat exchangers.

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31. The air conditioner as claimed in claim 30, wherein the refrigerant pipelines connected between the compressor, the first and second heat exchangers and wirings are arranged adjacent to a first side of the case.

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32. The air conditioner as claimed in claim 31, wherein the compressor and the first and second heat exchangers are mounted/dismounting through the first side, and the first and second fans are mounted/dismounted through a second side opposite to the first side.

33. The air conditioner as claimed in claim 30, wherein the duct further includes first

sliding guides provided at corners where the air inlet passage and the air outlet passage cross for guiding mounting/dismounting of the regenerative heat exchanger.

34. The air conditioner as claimed in claim 30, further comprising a base plate for
5 fixing the compressor thereon, and a second sliding guide in a bottom part of the case where the air outlet passage is for receiving the base plate in mounting/dismounting the base plate through the side.

35. The air conditioner as claimed in claim 30, wherein the sliding guide is provided
10 in the bottom of the case where the air outlet passage is.

36. The air conditioner as claimed in claim 30, further comprising:
third sliding guides provided between the regenerative heat exchanger and the second
air outlet for mounting/dismounting the second heat exchanger through a side of the case; and
15 fourth sliding guides provided between the regenerative heat exchanger and the first
air outlet for mounting/dismounting the first heat exchanger through a side of the case.

37. The air conditioner as claimed in claim 36, wherein the condensed water
receiving guide is formed in a bottom part of the case under a space between the third and
20 fourth sliding guides.

38. The air conditioner as claimed in claim 30, further comprising:
fifth sliding guides between the regenerative heat exchanger and the first air inlet for
mounting/dismounting the second fan through the side of the case; and

sixth sliding guides between the regenerative heat exchanger and the first air outlet for mounding/dismounting the first fan through the side of the case.

39. The air conditioner as claimed in claim 38, wherein the first or second fan
5 includes;

an orifice at a center for passing air,

a body to be inserted in the fifth or sixth sliding guides,

a motor having a rotation shaft positioned at the orifice, and

a blade assembly rotatably connected to the rotation shaft.

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40. The air conditioner as claimed in claim 8, wherein the first or second heat exchanger further includes a jig for covering an outside circumference of the fins.

41. The air conditioner as claimed in claim 40, wherein the jig includes a frame
15 having one opened side, for covering other sides of the first or second heat exchangers.

42. The air conditioner as claimed in claim 40, wherein the jig includes;

one pair of jig bodies to be folded for covering a circumference of the first or second heat exchanger from opposite sides, and

20 a hinge for coupling the one pair of jig bodies.

43. The air conditioner as claimed in claim 42, wherein the hinge is provided at a side opposite to the opened side.

44. The air conditioner as claimed in claim 42, wherein the jig body is fastened to the heat exchanger with a fastening member.

45. The air conditioner as claimed in claim 44, wherein the fastening member is
5 provided at an end of the jig body adjacent to the opened side.

46. The air conditioner as claimed in claim 42, wherein the jig body includes at least one drain hole provided in a bottom side for draining down the condensed water from the first or second heat exchanger.

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47. The air conditioner as claimed in claim 46, wherein the case further includes a condensed water receiving groove for storing the condensed water from the drain hole.

48. The air conditioner as claimed in claim 46, wherein the jig further includes a
15 condensed water container under the bottom side thereof for storing the condensed water from the drain hole.